

CLAIMS

What is claimed is:

1. An isolated polynucleotide comprising a nucleotide sequence encoding a first polypeptide that has at least 90% identity based on Clustal method of alignment compared to a polypeptide selected from the group consisting of a corn ammonium transporter polypeptide of SEQ ID NO:2, a soybean ammonium transporter polypeptide of SEQ ID NO:4, a wheat ammonium transporter polypeptide of SEQ ID NO:6, a corn ammonium transporter of SEQ ID NO:8, a rice ammonium transporter SEQ ID NO:10, a soybean ammonium transporter of SEQ ID NO:12 and wheat ammonium transporter of SEQ ID NO:14.

2. The isolated polynucleotide comprising the complement of the nucleotide sequence.

3. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence consists of the region of the isolated polynucleotide selected from the group SEQ ID NO:1, 3, 5, 7, 9, 11, and 13 that codes for the polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, and 14.

4. The isolated polynucleotide of Claim 1 which is DNA.

5. The isolated polynucleotide of Claim 1 which is RNA.

6. A chimeric gene comprising the isolated polynucleotide of Claim 1 operably linked to suitable regulation sequences.

7. An isolated host cell comprising the chimeric gene of Claim 6.

8. An isolated host cell comprising an isolated polynucleotide of Claim 1.

9. The isolated host cell of Claim 8, wherein the host cell is yeast.

10. The isolated host cell of Claim 8, wherein the host cell is a bacterial cell.

11. The isolated host cell of Claim 8, wherein the host cell is a plant cell.

12. A virus comprising the isolated polynucleotide of Claim 1.

13. A process for producing an isolated host cell comprising the chimeric gene of claim 6, the process comprising either transforming or transfecting an isolated compatible host cell with the chimeric gene of Claim 6.

14. An ammonium transporter polypeptide comprising at least 90% homology based on Clustal method compared to a polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12 and 14.

15. A method of selecting an isolated polynucleotide that affects the level of expression of the ammonium transporter polypeptide in a plant cell, the method comprising the steps of:

constructing an isolated polynucleotide comprising a nucleotide sequence of at least one of 30 contiguous nucleotides derived from a nucleotide sequence selected from the

group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13 and the complement of such nucleotide sequences;

introducing the isolated polynucleotide into a plant cell;

measuring the level of ammonium transporter polypeptide in the plant cell

5 containing the polypeptide; and

comparing the level of ammonium transporter polypeptide in the plant cell

containing the isolated polynucleotide with the level of ammonium transporter polypeptide in a plant cell that does not contain the chimeric gene.

10 16. The method of Claim 15 wherein the isolated polynucleotide consists of the region of the isolated polynucleotide selected from the group SEQ ID NO:1, 3, 5, 7, 9, 11, and 13 that codes for the polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8, 10, 12, and 14.

17. The method of Claim 15 wherein the isolated polynucleotide is DNA.

18. The method of Claim 15 wherein the isolated polynucleotide is RNA.

15 19. The method of Claim 15 wherein the isolated polynucleotide is a chimeric gene comprising the nucleotide sequence operably linked to suitable regulation sequences.

20. A method of selecting an isolated polynucleotide that affects the level of expression of ammonium transporter polypeptide in a plant cell, the method comprising the steps of:

20 constructing the isolated polynucleotide of Claim 1;

introducing the isolated polynucleotide into a plant cell;

measuring the level of ammonium transporter polypeptide in the plant cell

containing the polypeptide; and

comparing the level of ammonium transporter polypeptide in the plant cell

25 containing the isolated polynucleotide with the level of ammonium transporter polypeptide in a plant cell that does not contain the chimeric gene.

21. A method of obtaining a nucleic acid fragment encoding a substantial portion of an amino acid sequence encoding an ammonium transporter comprising:

30 (a) synthesizing an oligonucleotide primer comprising a nucleotide sequence of at least one of 50 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9, 11, 13 and the complement of such nucleotide sequences

35 (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences of the cloning vector wherein the amplified nucleic acid fragment encodes a substantial portion of an amino acid sequence encoding an ammonium transporter.